Claims

1. A handover method for providing a packet data service to a dual-band dual-mode mobile communication terminal in a mobile communication network in which asynchronous and synchronous mobile communication systems coexist, the dual-band dual-mode communication terminal being provided with an asynchronous modem unit and a synchronous modem unit, the asynchronous mobile communication system having a Gateway General packet radio service (GPRS) Support Node (GGSN) being connected to a packet data service node of the synchronous mobile communication system, the handover method comprising:

the first step of, as the mobile communication terminal that is connected to the asynchronous mobile communication system and uses the packet data service moves into an area of the synchronous mobile communication system, and a handover event occurs, a node B of the asynchronous mobile communication system notifying a Serving GPRS Support Node (SGSN)/GGSN of the asynchronous mobile communication system that handover is required;

the second step of the SGSN/GGSN requesting a mobile switching center of the synchronous mobile communication system to perform handover, and the synchronous mobile switching center requesting a base station of the synchronous mobile communication system to perform handover;

the third step of the synchronous mobile communication system performing a procedure of setting control signals and traffic for transmission of packet data;

the fourth step of the base station notifying the mobile switching center that handover has been completed and assigning a forward channel to the mobile communication terminal;

the fifth step of the mobile switching center notifying the SGSN/GGSN that handover has been completed;

the sixth step of, as the SGSN/GGSN commands the node B to perform handover, the node B directing the mobile communication terminal to perform handover;

the seventh step of performing assignment of a reverse channel between the mobile communication terminal and the synchronous mobile communication system, and the mobile communication terminal interfacing with the synchronous mobile communication system and notifying the base station that handover has been completed;

the eighth step of the synchronous mobile communication system performing call setup for the packet data service;

the ninth step of the base station notifying the synchronous mobile switching center that handover has been completed, and the mobile switching center notifying the SGSN/GGSN that handover has been completed; and

the tenth step of the SGSN/GGSN requesting the node B to release a connection to the mobile communication terminal.

2. The handover method according to claim 1, wherein the SGSN/GGSN receives an identification number of the mobile communication terminal at the first step.

3. The handover method according to claim 1, wherein the third step comprises the steps of:

the base station requesting a packet controller of the synchronous mobile communication system to assign a channel;

the packet controller requesting location registration from the packet data service node of the synchronous mobile communication system and receiving results of the location registration request;

the packet data service node requesting location registration from the SGSN/GGSN and receiving a reply to the location registration request; and

the packet controller transmitting channel assignment information to the base station.

4. The handover method according to claim 1, wherein a message, including the handover direction transmitted from the node B to the mobile communication terminal at the sixth step, includes information used for channel assignment between the mobile communication terminal and the synchronous mobile communication system.

5. The handover method according to claim 1, wherein the eighth step comprises the steps of:

the base station requesting the packet controller of the synchronous mobile communication system to set up a call;

the packet controller requesting location registration from the packet data service node of the synchronous mobile communication system and receiving results of the location registration request;

the packet data service node requesting location registration from the SGSN/GGSN and receiving a reply to the location registration request; and

the packet controller notifying the base station that call setup has been completed.

6. The handover method according to claim 1, wherein the GGSN of the asynchronous mobile communication system is connected to the packet data service node of the synchronous mobile communication system through a Packet data-Packet data (P-P) interface.

7. A handover method for providing a packet data service to a dual-band dual-mode mobile communication terminal in a mobile communication network in which asynchronous and synchronous mobile communication systems coexist, the dual-band dual-mode communication terminal being provided with an asynchronous modem unit and a synchronous modem unit, the asynchronous mobile communication system having a Gateway General packet radio service (GPRS) Support Node (GGSN) being connected to a packet data service node of the synchronous mobile communication system, the handover method comprising:

the first step of, as the mobile communication terminal, in a dormant state with respect to the asynchronous mobile communication system, moves into an area of the synchronous mobile communication system, a Serving GPRS Support Node (SGSN)/GGSN of the asynchronous mobile communication system receiving information indicating that handover is required;

the second step of the SGSN/GGSN commanding a base station of the synchronous mobile communication system to perform handover;

the third step of the mobile communication terminal attempting to originate a call to the base station, and executing call processing and channel assignment between the base station and the mobile switching center of the synchronous mobile communication system;

the fourth step of performing a negotiation related to call processing and setup between the mobile communication terminal and the base station;

the fifth step of the synchronous mobile communication terminal setting up a trunk;

the sixth step of initializing a radio link protocol between the mobile communication terminal and the base station; and

the seventh step of the base station notifying the mobile switching center that the channel assignment has been completed.

8. The handover method according to claim 7, wherein the SGSN/GGSN is notified by a node B of the asynchronous mobile communication system or the base station of the synchronous mobile communication system that handover is required at the first step.

9. The handover method according to claim 7, wherein the SGSN/GGSN receives an identification number of the mobile communication terminal at the first step.

10. The handover method according to claim 7, wherein a message, including the handover command transmitted from the SGSN/GGSN to the mobile communication terminal at the second step, includes channel assignment information and traffic channel entry information.

11. The handover method according to claim 7, wherein the third step comprises the steps of:

the base station transmitting a service request message to the mobile switching center in response to the attempt by the mobile communication terminal to originate a call;

the mobile switching center requesting the base station to assign a channel; and

the base station transmitting a channel assignment message to the mobile communication terminal.

12. The handover method according to claim 7, wherein the fifth step comprises the steps of:

the base station requesting the packet controller of the synchronous mobile communication system to set up a trunk;

the packet controller requesting the packet data service node to set up a trunk and receiving a reply to the trunk setup request; and

the packet controller transmitting a reply signal received from the packet data service node to the base station.

13. The handover method according to claim 7, wherein the GGSN of the asynchronous mobile communication system is connected to the packet data service node of the synchronous mobile communication system through a Packet data-Packet data (P-P) interface.

14. A mobile communication system in which asynchronous and synchronous mobile communication systems coexist, the asynchronous mobile communication system including a node B

functioning as a base station for wireless section communication with a dual-band dual-mode mobile communication terminal provided with an asynchronous modem unit and a synchronous modem unit, a radio network controller, a Serving General packet radio service (GPRS) Support Node (SGSN), and a Gateway GPRS Support Node (GGSN), the synchronous mobile communication system including a base station for supporting wireless section communication with the mobile communication terminal, a packet controller, and a packet data service node, the mobile communication system being capable of performing handover when the mobile communication terminal is using a packet data service, wherein:

the GGSN communicates with an IP network through an L1 layer for performing coding and modulation, an L2 layer for processing replies for message transmission, and a layer for tunneling the L2 layer, communicates with the SGSN through the L1 layer, the L2 layer, a User Datagram Protocol (UDP)/Internet Protocol (IP) layer for exchanging messages, and a GPRS Tunneling Protocol (GTP)-U layer for defining a flow of packet data and information, communicates with the packet data service node through the L1 layer, the L2 layer, the UDP/IP layer, a Generic Routing Encapsulation (GRE) layer for encrypting and compressing packets and a High-level Data Link Control (HDLC) framing layer for performing link management, synchronization problem solution, flow control and error control, and provides the packet data service through a Point-to-Point Protocol (PPP) layer,

a protocol stack of the SGSN includes an L1bis layer corresponding to the L1 layer of the GGSN, an Asynchronous Transfer Mode (ATM) layer for performing generation, extraction and exchange of packet data to correspond to the L2 layer, a UDP/IP layer and a GTP-U layer,

a protocol stack of the node B/radio network controller includes an L1 layer corresponding to the L1bis layer of the SGSN, a Media Access Control (MAC) layer for assigning radio resources for multimedia data processing to correspond to the ATM layer, a Radio Link Control (RLC) layer for establishing a radio link with the mobile communication terminal and combining and dividing packet data to correspond to the UDP/IP layer, and a Packet Data Convergence Protocol (PDCP) layer for compressing a packet data header to correspond to the GTP-U layer, and

the asynchronous modem unit of the mobile communication terminal performs data communication using a protocol stack that includes an HDLC framing layer for performing link management for link connection and disconnection, synchronization problem solution, flow control and error control to correspond to the MAC/RLC/PDCP layers of the node B/radio network controller, and a PPP layer for receiving data through the PPP layer of the GGSN.

15. The mobile communication system according to claim 14, wherein:

the packet data service node connected to the GGSN includes an L1bis layer corresponding to the L1 layer, an Asynchronous Transfer Mode (ATM) layer for performing generation, extraction and exchange of packet data to correspond to the L2 layer, a UDP/IP layer and a GTP-U layer,

a protocol stack of the base station/packet controller includes an L1 layer corresponding to the L1bis layer of the packet data service node, a MAC layer for assigning radio resources for multimedia data processing to correspond to the ATM layer, and a Radio Link Protocol (RLP) layer for requesting retransmission of erroneous frames to prevent errors from occurring in a wireless section to correspond to the UDP/IP layer,

the synchronous modem unit of the mobile communication terminal performs data communication using a protocol stack that includes an L1 layer, an HDLC framing layer for performing link management for link connection and disconnection, synchronization problem solution, flow control and error control to correspond to the MAC/RLP layers, and a PPP layer for receiving data through the PPP layer of the GGSN, and

the mobile communication terminal includes a common module that performs data communication through an L1 layer, a PPP layer, an IP layer, a transport layer and an application layer so as to convert protocols of data received from the asynchronous modem unit and the synchronous modem unit.